Body Image Issues and Attitudes Toward Exercise amongst Men Undergoing Androgen Deprivation Therapy (ADT) Following Diagnosis of Prostate Cancer

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Abstract

Background. Androgen Deprivation Therapy (ADT) is an established treatment for prostate cancer (PCa), but its side-effects can affect body appearance and functioning. However, research into the impact of ADT on body image is limited. Exercise can help patients to counterbalance some side-effects, potentially improving body image too. However, adherence to exercise recommendations is low. Therefore, we explored body image after ADT and attitudes towards exercise.

Methods. Twenty two semi-structured interviews were conducted with PCa patients receiving ADT (M_{age} = 67.9 yo, *SD* = 9.99).

Results. Participants expressed appearance dissatisfaction focusing on body feminization. Participants exercised to counterbalance ADT side-effects and improve mood. Exercise also helped them to re-establish a sense of control over their body and experience a sense of achievement. However, some men described being worried that their appearance and physical performance would be judged by others, so they often exercised alone or gave up exercise. Time management and fatigue were also identified as exercise barriers.

Conclusion. These findings highlight the need to further investigate body image concerns and exercise barriers in PCa patients undergoing ADT. These results could also inform support groups and health care professionals on the topic. However, further research should explore the most effective and acceptable ways to provide support to PCa patients on body image issues. ***Keywords***: prostate cancer, androgen deprivation therapy, body image, exercise, qualitative methods, cancer, oncology.

Body Image Issues and Attitudes Toward Exercise amongst Men Undergoing Androgen Deprivation Therapy (ADT) Following Diagnosis of Prostate Cancer

Prostate cancer (PCa) is the second most prevalent cancer among men worldwide and the third most prevalent cancer in Europe, with an estimate of 450000 new cases in 2018 [1]. Although PCa treatment options are improving outcomes for survival, each therapy is associated with side-effects. In this regard, androgen deprivation therapy (ADT) is of particular interest because of its potential impact on body composition and psychological wellbeing [2]. ADT is recommended by the National Institute for Health and Care in the UK (NICE guidelines) [3]. ADT increases prostate cancer specific survival [4] and is received by almost 50% of PCa patients at some point during treatment in the US, both as a stand-alone therapy or in combination with other treatments [5]. ADT reduces androgens levels with a gonadotropin releasing hormone (GnRH) agonist, interrupting testosterone supplies to prostate cancer cells. However, many patients experience side-effects including weight gain (reported by 70%), breast enlargement (28.6%), penile shrinkage (93%), lack of libido (58% to 91%), impotence (73.3% to 95%), incontinence (25% to 69%), hot flushes (44% to 80%), and fatigue (33% to 46.8%) [6, 7].

The bodily changes provoked by ADT can negatively impact the relationship patients have with their body, different both in its appearance and functioning, and potentially eliciting negative body image (defined as the negative subjective evaluation of one's body appearance and functioning) [8]. A large amount of literature has shown that negative body image represents a threat to one's psychological well-being [9].

However, to the best of our knowledge, only nine studies to date have investigated directly or indirectly body image concerns in PCa patients, representing a preliminary

contribution to the field. Qualitative studies by Ervik and Asplund (2012) and Navon and Morag (2003) highlighted how the bodily changes induced by ADT can prompt feelings of loss of masculine identity and shame for a feminized appearance [10, 11]. Similarly, Kelly (2009) found that patients felt their body was deeply different from how it had been before cancer [12].

In quantitative research, Fowler et al. (2002) and Harrington et al (2009) found that PCa patients undergoing ADT have significantly higher body image concerns when compared to ADT-naïve patients [13], and that body image issues were negatively correlated to quality of life (QoL) [14, 15]. In line with these results a longitudinal study by Taylor-Ford et al (2013) found that change in body image over time was a significant predictor of change in QOL among PCa patients on ADT [16].

These results highlight how ADT can have a negative impact on patients' relationships with their bodies. However, there is a lack of research investigating PCa patients' needs for support around body image issues. In general, previous studies found that PCa patients are often reluctant to seek psychological help [17]. This reluctance might be related to stereotypical views of masculinity where seeking help is considered inappropriate [18]. These results suggest that PCa patients might be reluctant to seek psychological help for body image issues as well. Therefore, patients might benefit from practical activities with a positive impact on psychological outcomes. Specifically, exercise could be an acceptable and effective way to reduce body image concerns in patients undergoing ADT, in addition to improving cancer-specific health outcomes [19, 20]. Indeed, some studies have supported this preliminary evidence. For example, a correlational study by Langelier et al (2018) found

that higher levels of aerobic exercise were associated with higher levels of masculinity, improved body image, and QOL in PCa patients [21-23].

Yet, although exercise could have a positive impact on both physical and psychological health [3, 20], adherence to exercise recommendations among PCa patients is very low [24]. A review by Thorsen et al. (2008) found only 30-40% of PCa patients adhered to the medical advice for physical activity (i.e., 150 min of moderate or 60 min. of vigorous aerobic exercise per week as recommended by the American College of Sports Medicine) [19, 25] and only 14% engaged in one session of weekly resistance training [26].

Research into perceived barriers to exercise in PCa patients has identified time management, fatigue, incontinence, but also limited resources, lack of expertise, and poor awareness of benefits [21, 22, 27]. Within the general population, body image concerns have also been cited as an exercise barrier [28], but research has yet to investigate whether they might contribute to lack of exercise in patients following ADT.

Aims

This study explored the impact of ADT side-effects on PCa patients' body image and sense of masculinity. Moreover, we investigated patients' attitudes towards exercise and potential exercise barriers in relation to ADT side-effects. Whilst body image and exercise have been considered in other cancers [29] there has been a lack of research in this area with regards to PCa.

Methods

The study received ethical approval from the Faculty Ethics Committee. The research was conducted qualitatively, since this method is ideal for capturing an insight into the impact of cancer at the individual level [12]. Moreover, qualitative methodology has been largely implemented in similar research [30, 31].

Participants

The study was advertised as "My body after Prostate Cancer", consisting of an interview focusing on ADT-induced body image changes and attitudes towards exercise. Participants were recruited through charities, social media and a press release. Men were eligible if they had had a diagnosis of prostate cancer, had followed ADT at some point in their life, and did not have any major condition preventing them from exercising.

Data collection

The interview topic guide was developed by the first author on the basis of previous literature and after discussing potential topics with PCa patients and fellow researchers (for full access to the topic guide, please access the **Supporting Information**). Thirteen participants were interviewed over the phone, while 9 face-to-face (Table 1). Participants gave informed consent, including permission to audio-record the session. Each interview was conducted by the first author, a woman in her twenties. The interviewer covered the topics of ADT, body image, and exercise, but customised the questions to the personal experience of each interviewee. Interviews lasted 30-50 minutes (M = 37.77 min., SD = 9.06 min.). The

audio-recordings were transcribed verbatim. Pseudonyms were used to protect participants' identity.

Data analyses

The transcripts were analysed using NVivo, applying thematic analysis and constant comparative method. This approach is not guided by any pre-existing theoretical framework [32] and is therefore ideal for relatively unexplored fields. The first author coded the interview transcripts following an iterative process of analysis, developing themes while collecting the data and then revising the themes once all the interviews were completed. The themes produced by the first author were discussed by the research team to ensure trustworthiness.

Results

Twenty-two patients were interviewed, two of which were excluded from the analyses because of poor audio recording quality. Participants' ages ranged from 43 to 85 years (Mage = 67.9 yr, SD = 9.99), they were all white British, self-identified as heterosexual, and time since diagnosis ranged between three months and 15 years (Table 1).

Body image issues as body feminization issues. Patients experienced several ADT-induced bodily changes, some of which had a distressing impact on their masculine identity. These changes often led participants to experience their body as inherently different from how it was prior to diagnosis, which they often wanted to return to.

Breast enlargement was the bodily change mentioned most often, identified by those who had experienced it as distressing, embarrassing, and feminizing. Men who had not experienced breast enlargement described their hope that they never would.

"*I suppose you sort of feminize (…)because obviously you get breast enlargement (…) It's embarrassing. I remember having the grandkid saying shouting to his sister "my grandad got boobies!" which is not nice you know…*" (Carl, 70 years old)

"I did fear (…) that I would start to grow, although it is ridiculous really, that I would start to grow breasts." (Marius, 61 years old)

Fat-increase was also concerning for many participants, who defined weight gain as undesirable aesthetically and functionally, and described their bodies as less masculine, less attractive and less capable of performing.

"(...) I am looking fatter as well as feeling fatter (…) I want to continue doing some of the vigorous exercise I have enjoyed in the past and I don't want to be carrying all this extra weight" (Eduard, 65 years old)

In this regard, many participants were concerned about loss of functionality due to muscle-wastage and fatigue. This change often led to feelings of distress, frustration, lowered physical self-efficacy, and sense of loss.

"Now my energy levels aren't as great as they used to be. So I can still walk (…) 8 to 10 miles a day…. Whereas before it was 15 to 20. But those days have gone now and I found that very sad." (James, 66 years old)

"Especially my arms… I'm thinking my muscles disappeared!" (Marcello, 59 years old)

ADT often caused penile-shrinkage, erectile dysfunction, and loss of libido. Although sexuality was not specifically included in the topic guide, sexual issues emerged as one of the most upsetting side-effects, contributing to the masculine identity crisis.

"It's upset… is uncomfortable, it's upset. (…) Obviously the physical side of our relationship is not totally fulfilled but… there are various ways around that (…) we talk about it…" (James, 66 years old)

Altogether, ADT-induced changes contributed to a sense of bodily feminisation and had a negative and distressing impact on patients' sense of masculinity.

"I feel very much emasculated at the moment…" (Eduard, 65 years old)

"I was somehow convinced that I was turning into a woman. So that's what it is and (…) just from a manly point of view that it is… quite… disturbing…." (Henry, 74 years old)

The ADT-provoked bodily changes induced feelings of loss for the body as it was prior to diagnosis and, for some participants, a loss of their identity as male. Some described frustration towards their current body, changed in its appearance and functioning. Some men expressed regret for not appreciating their bodies more when they were cancer-free.

"Why should I worry too much about myself? But yet… at the same time I know my own identity and my own identity is not to be overweight with breasts." (Sander, 54 years old)

"I took my body pretty much for granted, I'm afraid." (Jacob, 68 years old)

In this respect, some participants tried to accept their bodily changes as part of the general process of ageing. They thought they would have been more bothered at a younger age, when their expectations around bodily appearance and functioning were higher.

"I think in my case age is coming into it. I talked to some of the other members (of the group which the man attended) *who were younger and they are full of worries and worries (…) I look at myself in the mirror and I think well you are not the handsome guy you used to be but never mind…. at 80 what do you expect?"* (George, 80 years old)

However, during the interviews younger patients did not explicitly referred to their young age as an aggravating factor.

Compromising exercise and side-effects: between compensation and barriers.

Most participants reported to regularly engage in light exercise, often walking and cycling, but also pilates and light weights lifting. Exercise was identified as an effective strategy to compensate ADT side-effects, weight gain in particular and helped patients enhance resilience against cancer.

"Certainly regular exercise does help to keep your weight down…" (Ludovick, 73 years old)

"If you don't exercise your cancer will grow. Your body needs exercise." (Carl, 70 years old)

However, patients referred how side-effect severity could represent an exercise barrier itself. Specifically, men who were working and struggling with fatigue found engaging in exercise very difficult.

"I am working full time, and you are tired after work. It is difficult to fit exercise in your day…" (Marius, 61 years old)

Therefore, exercise represented an effective strategy to compensate for ADT side-effects, but it was only accessible when the side-effects were not too severe.

"It can be self-perpetuating… if you feel tired and you don't exercise, you stay tired. The exercise actually increases your energy level… but sometimes it depends… there are days where I have literally set down" (Peter, 77 years old)

Psychological implications of exercise: between empowerment and fear of evaluation. Participants described how exercising helped them to focus on what their body could still do, giving them a sense of achievement, physical self-efficacy and body confidence.

"That makes me feel good inside, the fact that I have done it! And I can push myself a little bit harder the next time" (Richard, 65 years old)

Exercise also gave participants a sense of control over their bodies, which helped them reduce health-related anxiety.

"So you get that sort of positive buzz from the fact that you are under still a little bit of control over your body…your cancer is incurable. I don't know how long I have got but it's just gratifying and reassuring that I can still do things" (Micheal, 67 years old)

However, some participants reported to not exercise (n = 2) or to exercise alone (n = 17), in order to avoid feeling judged by others for their physical performance and appearance, both negatively affected by cancer and ADT.

"Unfortunately with the walking machine you got somebody else in front of you or next to you and you still think - Oh they are quicker!" (George, 80 years old)

"I wouldn't like to be in a situation where I slow the group down." (James, 66 years old)

"I went to the gym regularly and did a lot of swimming. So my body appearance was on view (…) which slightly embarrassed me, you know the changes (…) probably because of my body image I didn't do any swimming for some time…" (Henry, 74 years old)

"Would I have been more likely to go for a swim if I wasn't on hormone therapy? Possibly yes I think" (Sander, 54 years old)

In conclusion, exercise seemed to enhance patients' body confidence and reduce health-related worry. However, fear of negative evaluation for body appearance and functioning seemed to prevent some patients from accessing the positive psychological effects of exercise.

Discussion

This qualitative study explored the impact of ADT- related side-effects on PCa patients' body image and their attitudes towards exercise. Our results supported and expanded previous findings.

In line with previous literature, most of the patients referred to ADT-induced bodily changes as distressing because they were feminizing [10, 11]. The combination of weight gain, breast enlargement, functionality loss, and sexual issues left patients with a body that was perceived as profoundly different from the one they had prior to diagnosis, both for its appearance and functioning, representing a threat to patients' masculine identity. Being strong, muscular and sexually active are key features of a masculine ideal [23], which can be referred to as an hegemonic model centred around competitiveness, sexual and athletic power, control and stoicism [33]. In this regard, our findings are in line with the results of gender studies investigating how patients come to terms with a body altered by ADT in

relation to masculine ideals [33]. More research is needed to investigate whether and how PCa patients undergoing ADT could find their own masculine identity beyond those stereotypical characteristics. Participants who regularly engaged in exercise referred to doing so in order to improve their health and compensate for ADT side-effects. Exercise not only helped participants to improve their mood and energy levels, but also gave them a sense of achievement and control over their body. The present study deepened the latter finding, which was only partially explored by previous literature [12, 23]. Participants defined being able to exercise as a reassuring demonstration of their abilities and strength, despite cancer. These results are in line with body functionality theory, stating that focusing on everything that the body can do rather than how it looks can have a positive impact on body image [34]. Similarly, our results suggest that exercise could be an effective and acceptable strategy to improve body image in PCa patients undergoing ADT, by encouraging them to focus on what their body can still do. Future research could further investigate the relationship between exercise, functionality theory and body image in PCa patients.

In line with previous studies [21], participants who were suffering from ADT-induced fatigue and still working full time particularly struggled to exercise. Some were also concerned about being judged by other men, both for their appearance (especially breast enlargement) and performance. Fear of negative evaluation led participants to avoid exercise-groups, or give up exercise completely. Our study expands previous literature by highlighting how fear of negative evaluation might partially explain the low exercise rates in this clinical group [24]. Even if exercise does have a positive impact on body image issues, fear of negative evaluation might prevent PCa patients from experiencing exercise benefits. Future research should explore this further, investigating underlying cognitive mechanisms of fear of negative evaluation in PCa patients undergoing ADT. Reducing social comparison and fear

of negative evaluation and encouraging patients to exercise in supportive groups, would be crucial to facilitate regular exercise engagement long term [35], improving patients' psychological well-being.

Clinical implications

PCa patients currently refer a lack of information from health care professionals about the impact of ADT-side effects [11]. These findings suggest that patients might benefit at the beginning of their treatment from specific information from health care professionals and support groups around ADT-induced bodily changes and their psychological impact. However, given the reluctance of men to talk about the aforementioned issues, further research should explore the most effective and acceptable ways to provide support around body image issues and exercise.

Limitations

This study has some limitations. Firstly, despite the study being open to any PCa patients having been treated with ADT, only white British heterosexual men volunteered to take part. Despite this being a common issue in this area of research [36], the scarce variation of the sample negatively affects qualitative results [37]. Moreover, this study does not provide information around potential differences in body image issues between PCa patients following ADT and ADT-naïve patients. Despite the transcripts and themes being thoroughly discussed within the research group, another limitation lies in the lack of triangulation of the findings by a second researcher. Lastly, this study only captured the perspective of PCa patients who were already physically active or seemed interested in exercise

Moreover, it is worth considering some characteristics of the research process that might have affected the study results. Firstly, many participants found talking about the relationship with their bodies challenging. Some described not feeling socially allowed to express such discomfort as an adult male, as to do so would go against the masculine stereotype of a confident man [38]. This might have influenced the results, since this study might not be capturing the views of PCa patients who are not willing to talk about body image at all. This seems to be in line with another qualitative study by Grogan and Richards (2002), investigating body image in males [39].

Another factor to take into consideration is the gender and age gap between the interviewer and the participants. While the first author was a woman in her late twenties at the time of the data collection, all the interviewees were males between their forties and eighties. This gap may have influenced the quantity and quality of information patients shared. Some might have found it difficult to open up and relate to a young female. However, other patients mentioned feeling more comfortable talking with women (e.g., wives, friends, and often nurses), considered more empathetic compared to males. In support of this, in a previous study by Chapple and Ziebland (2002), PCa patients were given the choice to be interviewed either by a male or a female researcher and all the participants - with the exception of one - preferred to talk to the female researcher [40].

Conclusion

In line with previous literature, our results suggest that ADT side-effects can be detrimental for men's appearance and functionality satisfaction, impacting negatively on the relationship they have with their body and on their sense of masculinity. Exercise seems to be an effective strategy to compensate ADT side-effects, increasing patients' sense of control

and physical self-efficacy. Our study expands previous literature by suggesting that fear of negative evaluation might prevent some patients from exercising and therefore from experiencing its positive psychological effects.

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Conflict of interest statement.

The authors have no conflicts of interest to declare.

Data access statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Tables

Table 1

Demographic characteristics of the sample

Pseudonym	Age	Marital status	Education	Treatment	Time on ADT	Type of ADT (if known)	Years since diagnosis	Interview
Marius	61	married	Bachelor's degree	surgery, radiotherapy, ADT	3 years	Zoladex	6	Face-to-face
Jacob	68	married	Doctoral degree	radiotherapy, brachytherapy, ADT	3 years	Zoladex, Casodex	12	Face-to-face
Robert	58	married	Master's degree	surgery, radiotherapy, ADT	1 year	Zoladex	3	Face-to-face
Paul	73	married	Bachelor's degree	surveillance, ADT, chemotherapy	2 years (ongoing)	N/K	15	Face-to-face
Raphael	85	widowed	Grammar school	surveillance, ADT	5 years (ongoing)	N/K	4	Face-to-face
James	66	married	Master's degree	radiotherapy, ADT	12 years (ongoing)	Casodex, Prostact	12	Telephone
Elvio	73	married	Grammar school	surgery, radiotherapy, ADT	3 years	N/K	8	Face-to-face
Matthew	83	divorced	Bachelor's degree	ADT	N/K	N/K	7	Face-to-face
Luca	43	married	Grammar school	ADT	3 years (ongoing)	Zoladex, Casodex	4	Telephone
George	80	married	College	ADT	3 years (ongoing)	N/K	3	Face-to-face

Henry	74	married	Technical school	brachytherapy, ADT, radiotherapy	18 months	Casodex	10	Telephone
Carl	70	married	Bachelor's degree	ADT	13 years (ongoing)	Casodex, Lupron, Prostact	13	Telephone
Phil	75	married	Doctoral degree	radiotherapy, brachytherapy, ADT	N/K	N/K	3	Telephone
Eduard	65	engaged	Bachelor's degree	ADT, chemotherapy	1 year (ongoing)	N/K	1	Telephone
Michael	67	married	Technical school	ADT, chemotherapy	N/K	N/K	2	Telephone
Valerio	57	single	Grammar school	radiotherapy, ADT	N/K	N/K	5	Telephone
Ludvik	73	married	Master's degree	radiotherapy, ADT	3 months	N/K	3 months	Telephone
Alessandro	68	married	Master's degree	surgery, radiotherapy, ADT	2 years (ongoing)	Casodex	3	Telephone
Richard	65	married	College	radiotherapy, ADT	1 year (ongoing)	N/K	1	Telephone
Peter	77	married	Grammar school	radiotherapy, ADT	2 years (ongoing)	N/K	1	Telephone
Marcello	59	married	College	ADT, chemotherapy	3 years (ongoing)	Zoladex	4	Telephone
Sander	54	married	Master's degree	surveillance, surgery, radiotherapy, ADT	3 years	N/K	2	Face-to-face

Note. ADT = Androgen Deprivation Therapy